

**WE CLAIM:**

5 1. A photonic device comprising a photonic crystal having configuring means for effecting a change to the physical geometry in at least one region of said photonic crystal such that the propagation of light therethrough or the confinement of light therein is thereby altered.

10 2. The photonic device of claim 1, wherein said configuring means includes an electrostrictive component of said photonic crystal.

3. The photonic device of claim 1, wherein said configuring means includes a piezoelectric component of said photonic crystal.

15 4. The photonic device of claim 1, wherein said configuring means includes a magnetostrictive component of said photonic crystal.

5. The photonic device of claim 1, wherein said configuring means includes an actuation device affixed to said photonic crystal.

20 6. A photonic device as recited in one of claims 1 to 5, wherein said configuring means provides at least one change in the respective direction of propagation of one or more beams of light of fixed frequency.

25 7. A photonic device as recited in one of claims 1 to 5, wherein said configuring means provides at least one change in the respective electromagnetic field pattern of one or more modes of confined light.

30 8. A photonic device as recited in one of claims 1 to 5, wherein said configuring means provides at least one change in the

respective frequency of one or more beams of light propagating through said device.

5 9. A photonic device as recited in one of claims 1 to 5, wherein said configuring means provides at least one change in the respective frequency of one or more modes of light confined in said device.

10 10. A photonic device as recited in one of claims 1 to 5, wherein said configuring means provides at least one change in the non-linear response in said device, for light propagating therethrough or confined therein.

15 11. A photonic device as recited in one of claims 1 to 5, wherein photonic device in claim 1, wherein said configuring means provides at least one change in each of the respective direction and frequency of one or more beams of light propagating through said device.

20 12. A photonic device as recited in one of claims 1 to 5, wherein said configuring means provides at least one change in each of in the respective electromagnetic field pattern and frequency of one or more modes of light confined in said device.

25 13. A photonic device as recited in one of claims 1 to 5, wherein said configuring means provides at least one change in each of the respective spatio-temporal electric and magnetic field intensities associated with one or more beams of light propagating through said device, or confined therein.

14. A photonic device as recited in one of claims 1 to 5, wherein said configuring means provides one or more changes in the respective direction, frequency, electric and magnetic field intensity, or combinations thereof, associated with one or more beams of light propagating through said device as a function of time.

15. A photonic device as recited in one of claims 1 to 5, wherein said configuring means provides one or more changes in the respective electromagnetic field pattern, frequency, electric and magnetic field intensity, or combinations thereof, associated with one or more modes of light confined within said device as a function of time.

16. A photonic device as recited in one of claims 1 to 5, wherein said configuring means provides at least one change in the symmetry of one or more modes of light confined in said device, or propagating therethrough.

17. A photonic device as recited in one of claims 1 to 5, wherein said configuring means is adaptive for configuration in part or in whole of said device, and includes compensation in part or in whole of said device, and includes compensation in part or in whole of the physical geometry of said photonic crystal.

18. A photonic device as recited in one of claims 1 to 5, wherein said configuring means comprises at least one measured output signal to said device and at least one applied input signal to change the physical geometry of said device, so as to provide for either closed loop control or open loop control.

19. A photonic crystal for use in a photonic device, said photonic crystal comprising configuring means for effecting a change to

the physical geometry in at least one region of said photonic crystal such that the propagation of light therethrough or the confinement of light therein is thereby altered.

5           20.           The photonic crystal of claim 19, wherein said configuring means includes an electrostrictive component of said photonic crystal.

21.           The photonic crystal of claim 19, wherein said configuring means includes a piezoelectric component of said photonic crystal.

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22.           The photonic crystal of claim 19, wherein said configuring means includes a magnetostrictive component of said photonic crystal.

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23.           The photonic crystal of claim 19, wherein said configuring means includes an actuation device affixed to said photonic crystal.

09010306.023104  
FOI# 201306160